Health Care for the Homeless

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Bibliography #2

Immunization Status of Homeless and Low-Income Children

January 2003

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Policy Research Associates, Inc. • 345 Delaware Avenue, Delmar, New York 12054

Under contract to the Health Resources and Services Administration, Bureau of Primary Health Care

2002

Beech BM, Myers L, Beech DJ.. **Hepatitis B and C infections among homeless adolescents.** Fam Community Health 25(2): 28-36, July 2002.

The lifestyle of homeless adolescents places them at high risk for contracting serious illnesses. This study sought to determine the hepatitis status and predictors of hepatitis infection among 150 homeless adolescents. Each participant took a psychosocial survey and provided a venous blood sample. Most respondents (95%) had engaged in sexual intercourse; approximately 36% indicated they had exchanged sex for food, shelter, or drugs. Youth reported a high rate of consistent condom use, however, 22% tested positive for hepatitis B or C. Homeless youth should be considered a high-risk group for hepatitis B or C virus infection. As hepatitis B vaccination programs have been targeted at school-based youth, most homeless youth are missed by these efforts. Targeted programs are needed to immunize this high-risk group.

Hayes-Bautista DE, Hsu P, Perez A, Sosa L. **The Hepatitis A burden in California's Latino children.** Los Angeles, CA: Center for the Study of Latino Health & Culture, Division of General Internal Medicine & Health Services Research, UCLA School of Medicine.

The Centers for Disease Control (CDC) has identified California as one of 11 states classified as "very high rate states" for hepatitis A (defined as an average annual prevalence of 20 cases per 100,000 or higher) for the 1987-97 period. Hepatitis A, however, is not evenly distributed over the state's population. Latino populations have disproportionately high rates, and Latino children have extremely high rates. Age- and race/ethnic-specific rates were derived using reportable diseases data supplied by the California Department of Health Services Surveillance and Statistics Section for 1996-2000 and demographic data from the California Department of Finance. Study sample: the 2.3 million Latino children (age 0-14) in the five Southern California counties (Los Angeles, Orange, Riverside, San Bernardino and San Diego) or plurality of all children (Orange, San Diego) in those counties. Data from the Current Population Survey show that 31% of Latino children in the state have no health insurance, and more than 90% are U.S. citizens by birth. Estimated costs for care of children with hepatitis A range from \$10 to \$13 million, and an estimated 111,000 school are lost during that period. The Advisory Committee on Immunization to 144,000 days of Practices (ACIP) recommends routine vaccination of children in areas where rates of hepatitis A are equal to greater than 20 cases per 100,000. **AVAILABLE** FROM: http://www.cesla.med.ucla.edu/html/pdf/hepfinal.pdf.

Kendal AP, Peterson A, Manning C, Xu F, Neville LJ, Hogue C. **Improving the health of infants on Medicaid by collocating special supplemental nutrition clinics with managed care provider sites**. Am J Public Health, 92(3):399-403, March 2002.

OBJECTIVES: This study tested whether collocation of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) clinics at managed care provider sites improved health care for infants enrolled in Medicaid and WIC. METHODS: Weights and immunization rates were studied for the 1997 birth cohort of African American infants enrolled in WIC and Medicaid in Detroit, Mich. Infants using traditional WIC clinics and health services were compared with those enrolled under Medicaid in 2 managed care organizations (MCOs), of whom about half obtained WIC services at MCO provider sites. RESULTS: Compared with other infants, those who used collocated WIC sites either were closer to their age-appropriate weight or had higher immunization rates when recertified by WIC after their first birthday. Specific benefits

(weight gain or immunizations) varied according to the priorities at the collocated sites operated by the 2 MCOs. CONCLUSIONS: Collocation of WIC clinics at MCO sites can improve health care of low-income infants. However specific procedures for cooperation between WIC staff and other MCO staff are required to achieve this benefit.

Shefer AM, Fritchley J, Stevenson J, Lyons B, Friedman R, Hopfensperger D, Mize J, Rodewald LE.Linking **WIC and immunization services to improve preventive health care among low-income children in WIC.** J Public Health Manag Pract, 8(2):56-65, March 2002.

Children participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) are at risk for low immunization coverage and other adverse health-related outcomes. Immunization-promoting strategies in WIC have been shown to produce dramatic improvements in immunization coverage. This evaluation of a local WIC initiative in Milwaukee is the first study to evaluate the impact of these strategies on improving the utilization of other clinical preventive services at the medical home. The use of more intensive immunization-promoting strategies in WIC may improve utilization of well child care visits and receipt of other clinical preventive services in the medical home.

2001

Brenner RA, Simons-Morton BG, Bhaskar B, Das A, Clemens JD. **Prevalence and predictors of immunization among inner-city infants: A birth cohort study.** Pediatrics, 108(3):661-70, Sept 2001.

CONTEXT: Although the proportion of US children who are appropriately immunized increased dramatically in the past decade, rates remain suboptimal among low-income, inner-city youth. Timely initiation of immunization is an important predictor of immunization status later in childhood. Prospective studies identifying predictors of initiation are lacking. OBJECTIVES: (1) describe immunization patterns in a cohort of infants born to predominately low-income, inner-city mothers; (2) identify determinants, as measured at birth, of immunization status at 3 and 7 months of age; and (3) identify determinants of continuation of immunization among those who initiate immunization by 3 months of age. DESIGN: Prospective, birth cohort study. METHODS: Maternal/infant dyads were systematically selected from 3 District of Columbia hospitals between August 1995 and September 1996. The mothers were interviewed shortly after delivery, at 3 to 7 months postpartum, and at 7 to 12 months postpartum. Medical records were reviewed at all reported sites of care for 324 infants (88%). Vaccinations assessment included diptheria, tetanus, and pertussis, polio, and Haemopilus influenza type B. Analyses were used to determine factors associated with immunization status of infants at 3 and 7 months. RESULTS: At 3 months of age, 75% of infants were up-to-date versus only 41% at 7 months. Baseline factors associated with being up-to-date at 3 months included enrollment in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) during pregnancy, intention to breastfeed and presence of the infant's grandmother in the household. Infants were less likely to be up-to-date if their mothers perceived higher barriers to immunization. Baseline factors associated with being up-to-date at 7 months included lower birth order and maternal employment. Among the subset of infants who were upto-date at 3 months, only 53% remained up-to-date at 7 months. Factors measured at the first follow-up interview that were associated with continuation of immunization at 7 months included maternal employment and lower perceived barriers. CONCLUSIONS: Immunization rates during the first 7 months of life were low in this inner-city population. Factors associated with immunization status that are potentially amenable to change included perceived barriers to immunization and enrollment in WIC during pregnancy.

application: The impact of a community-wide intervention to improve the delivery of preventive services to children. Pediatrics, 108(3):E42, September 2001.

OBJECTIVE: To improve health outcomes of children, the US Maternal and Child Health Bureau has recommended more effective organization of preventive services within primary care practices and more coordination between practices and community-based agencies. However, applying these recommendations in communities is challenging because they require both more complex systems of care delivery within organizations and more complex interactions between them. To improve the way that preventive health care services are organized and delivered in 1 community, we designed, implemented, and assessed the impact of a health care system-level approach, which involved addressing multiple care delivery processes, at multiple levels in the community, the practice, and the family. Our objective was to improve the processes of preventive services delivery to all children in a defined geographic community, with particular attention to health outcomes for low-income mothers and infants. DESIGN: Observational intervention study in 1 North Carolina county involving low- income pregnant mothers and their infants, primary care practices, and departments of health and mental health. The study assessed rates of preventive services in office practices before and after the intervention and compared maternal and child health outcomes for women enrolled in an intensive home visiting program with women who sought prenatal care during the 9 months before the program's initiation. Outcomes were assessed when the infants reached 12 months of age. INTERVENTIONS: Our primary objective was to achieve changes in the process of care delivery at the level of the clinical interaction between care providers and patients that would lead to improved health and developmental outcomes for families. We selected interventions that were directed toward major risk factors (eg, poverty, ineffective care systems for preventive care in office practices) and for which there was existing evidence of efficacy. RESULTS: There were high levels of participation, changes in the organization of the delivery system, and improvements in preventive health outcomes. Agencies cooperated in joint contracting, staff training, and defining program eligibility. All 8 eligible practices agreed to participate and 7/8 implemented at least 1 new office system element. Of eligible women, 89% agreed to participate, and outcome data were available on 80% (180/225). Intervention group women were significantly more likely than comparison group women to use contraceptives (69% vs 47%), not smoke tobacco (27% vs 54%) and have a safe and stimulating home environment for their children. Intervention group children were more likely to have had an appropriate number of well-child care visits (57% vs 37%) and less likely to be injured (2% vs 7%). Intervention mothers also received Aid to Families with Dependent Children for fewer months after the birth of their child (7.7 months vs 11.3 months). CONCLUSIONS: We observed a number of positive effects at all 3 levels of intervention. Policy-level changes at the state and community led to lasting change the organization and financing of care, which enabled changes in clinical services to take place. These changes have now been expanded beyond this community to other communities in the state. We were also able to engage multiple practice organizations, reduce duplication, and improve the coordination of care. Changes in the process of preventive services delivery were noted in participating practices. Finally, the outcomes of the family-level intervention were comparable in direction and magnitude to the outcomes of previous randomized trials of the intervention. All the changes were achieved over a relatively brief 3-year study period, and many have been sustained since the project was completed. Tiered, interrelated interventions directed at an entire population of mothers and children hold promise to improve the effectiveness and outcomes of health care for families and children.

Vivier PM, Alario AJ, Peter G, Leddy T, Simon P, Mor V. **An analysis of the immunization status of preschool children enrolled in a statewide Medicaid managed care program.** J Pediatr 2001 Nov;139(5):624-9, Comment in: J Pediatr, 139(5):613-5, November 2001.

OBJECTIVES: To measure immunization coverage rates for children enrolled in a statewide Medicaid managed care program and determine the impact of sociodemographic characteristics and the type of primary care provider site on immunization coverage. STUDY DESIGN: A random sample of 2000 was chosen from children between the ages of 19 and 35 months who had been continuously enrolled in the Medicaid managed

care program for 1 year. Sociodemographic data and a list of primary care providers for the study children were obtained from administrative databases. Immunization histories were determined by medical record review. RESULTS: Vaccine-specific immunization rates for diphtheria-tetanus-pertussis, polio, Haemophilus influenzae type b, hepatitis B, and measles-mumps-rubella ranged from 87% to 94%, with an overall coverage ate of 75%. Overall immunization status varied by primary care provider site as follows: office-based, 72%; community health center, 75%; hospital-based clinic, 79%; and staff model health maintenance organization, 85% (chi(2) test, P = .008). CONCLUSIONS: Immunization rates compare favorably with national rates for this low-income group. Sociodemographic characteristics were not important predictors of underimmunization, but rates did vary by the type of primary care provider site.

2000

Cotter JJ, McDonald KA, Parker DA, McClish DK, Pugh CB, Bovbjerg VE, Tipton GA, Rossiter LF, Smith WR. **Effect of different types of Medicaid managed care on childhood immunization rates**. Eval Health Prof, 23(4):397-408, December 2000.

Medicaid managed care can improve access to prevention services, such as immunization, for low-income children. The authors studied immunization rates for 7,356 children on Medicaid in three managed care programs: primary care case management (PCCM; n=4,605), a voluntary HMO program (n=851), and a mandatory HMO program (n=1,900). Immunization rates (3:3:1 series) in PCCM (78%) exceeded rates in the voluntary HMO program (71%), which in turn exceeded those in the mandatory HMO program (67%). Adjusting for race, urban residence, and gender, compared to children in PCCM, children in the voluntary HMO program were less likely to complete the 3:3:1 series, and children in the mandatory HMO program were even less likely to complete the series. Results differed by individual HMOs. Monitoring of outcomes for all types of managed care by Medicaid agencies is imperative to assure better disease prevention for low-income children.

Kerpelman LC, Connell DB, Gunn WJ. Effect of a monetary sanction on immunization rates of recipients of aid to families with dependent children. JAMA, 284(1):53-9, July 5, 2000.

CONTEXT: Immunization rates among low-income families have lagged behind those for the general community, with several possible barriers cited in the literature. OBJECTIVE: To evaluate the effect of an initiative aimed at improving immunization rates among low-income preschool children by imposing a sanction on families who failed to provide proof of up-to-date immunization status. DESIGN AND SETTING: Randomized, controlled before-after trial conducted from January 1, 1993, through December 31, 1996, in Muscogee County, Georgia. PARTICIPANTS: A total of 2500 families with children aged 6 years or younger who received Aid to Families with Dependent Children assistance. INTERVENTION: Families in the intervention group (n=1500) were informed that receipt of the welfare benefit for any preschool-aged children was contingent on provision of proof of up-to-date immunization status at the beginning of welfare eligibility and, subsequently, semiannually or annually. Case families in the control group (n=1000) were encouraged to immunize their preschool children but were not informed of any aid sanctions nor did such sanctions apply to them. MAIN OUTCOME MEASURE: Age-appropriate rates of 5 immunizations (measles-mumps-rubella; poliovirus; diphtheria and tetanus toxoids and pertussis; Haemophilus influenzae type b; and hepatitis B), based on examination (with family's written consent) of medical provider records, compared among intervention-group vs control-group families. RESULTS: There were no significant differences at baseline between intervention and control families in immunization rates of preschool children. Families in the intervention group were significantly more likely than families in the control group to have up-to-date immunization status in all 4 years of the study for all 5 immunizations (with 3 exceptions). At age 2 years, 72.4% of children in the intervention group vs 60.6% of those in the control group achieved vaccine

series completion, which included 4 diphtheria and tetanus toxoids and pertussis, 3 poliovirus, and 1 measles-mumps-rubella. Sanctions were implemented only 11 times. There was relatively little increased burden on the part of families to comply with requirements. CONCLUSION: In our study, a monetary sanction in a population receiving welfare benefits stimulated a significant increase in childhood immunization rates, suggesting that when welfare recipients are given an incentive to keep their children's immunizations up-to-date, most are able to do so.

Kempe A, Beaty B, Englund BP, Roark RJ, Hester N, Steiner JF. **Quality of care and use of the medical home in a state-funded capitated primary care plan for low-income children**. Pediatrics, 105(5):1020-8, May 2000.

OBJECTIVE: To evaluate the quality of care and use of the medical home in a state-funded capitated insurance plan for low-income children-the Colorado Child Health Plan (CCHP). DESIGN: A retrospective cohort study using medical record review at pediatric and family practice offices in 4 geographic areas of Colorado. At each practice, CCHP-enrolled children (6 months to 6.5 years) and 2 controls were selected, 1 with Medicaid (MK) and 1 with private insurance (PI), matched by date of birth to the CCHP-enrolled child (n=596). CCHP-enrolled children with a diagnosis of asthma, aged 3 to 18 years, and asthmatic children with MK and PI, matched by age, were also selected from each practice (n=139). RESULTS: Quality of preventive services were comparable in the 3 groups. CCHP-enrolled children made more health maintenance visits than MK-enrolled children (1.3 CCHP vs.9 MK vs 1.1 PI) and were more frequently screened for lead (8.1% CCHP vs 3.4% MK vs 1.2% PI) and anemia (5.0% CCHP vs 4.4% MK vs 2.4% PI) than children in either control group. Documented immunization rates were similar in the 3 groups, but a shift in location of immunization from public health clinics to the primary care site was seen in the CCHP group. CCHP-enrolled children made more office visits for acute care than did MK-enrolled children (4.1 CCHP vs 3.1 MK vs 3.4 PI), but a higher proportion of these visits took place at the medical home rather than the emergency department for the CCHP group (.04) as compared with the MK (.07) or PI (.06) groups. Asthmatic children in the CCHP group made more preventive office visits for maintenance therapy and more frequently used the primary care site rather than the emergency department for acute exacerbations than did children with PI (mean ratio of emergency department visits to total acute visits.04 CCHP vs.06 MK vs.19 PI). CONCLUSIONS: Despite capitated reimbursement for primary care services, CCHP provided children from low-income families with preventive, acute, and chronic care services of comparable quantity and quality to those received by children with MK or PI. The program was associated with a shift of immunization location to the primary care site and increased health maintenance care for new enrollees. CCHP-enrolled children used their medical home for the majority of acute health needs and were not high utilizers of emergency department or hospital services.

York R, Tulman L, Brown K. **Postnatal care in low-income urban African American women: Relationship to level of prenatal care sought.** J Perinatol, 20(1):34-40, Jan-Feb 2000.

OBJECTIVE: This study examined the relationship between level of prenatal care utilization and postnatal patterns of health care behavior among high-risk minority women. The primary hypothesis was that prenatal care utilization predicts subsequent levels of both the maternal and child health services used in the postnatal period. METHODS: The study population consisted of 297 low-income African American women who were recruited at delivery at an urban tertiary medical center in the Mid-Atlantic region. They were followed monthly for 1 year using telephone interviews to determine their use of maternal and child health services. Four levels of prenatal care were identified retrospectively based on reviews of health records and screening interviews using the Kessner Index. Data regarding pregnancy outcomes, maternal postnatal visits, and well-child and acute care child visits were collected. RESULTS: Women who sought inadequate or no prenatal care had greater infant morbidity and mortality in the postnatal period and significantly lower levels of attendance at maternal postnatal visits, well-child visits, immunization completions, and acute care visits. CONCLUSION: This study confirms that the level of prenatal care is indicative of the level of postnatal care

women seek for themselves and their children in the first year after delivery.

1999

Bolton P, Holt E, Ross A, Hughart N, Guyer B. **Estimating vaccination coverage using parental recall, vaccination cards, and medical records.** Public Health Rep, 113(6):521-6, Nov-Dec 1998. Comment in: Public Health Rep, 114(1):3-4, Jan-Feb 1999.

OBJECTIVE: To compare estimates based on vaccination cards, parental recall, and medical records of the percentages of children up-to-date on vaccinations for diphtheria, tetanus, and pertussis; polio; and measles, mumps, and rubella. METHOD: The authors analyzed parent interview and medical records data from the Baltimore Immunization Study for 525 2-year-olds born from August 1988 through March 1989 to mothers living in low-income Census tracts of the city of Baltimore. RESULTS: Only one-third of children had vaccination cards; based on medical records, these children had higher up-to-date coverage at 24 months of age than did children without cards. For individual vaccines, only two-thirds of parents could provide information to calculate coverage rates; however, almost all provided enough information to estimate coverage for the primary series. For each vaccine and the series, parental recall estimates were at least 17 percentage points higher than estimates from medical records. For children without vaccination cards whose parents could not provide coverage information, up-to-date rates based on medical records were consistently lower than for children with cards or with parents who provided coverage information. CONCLUSIONS: Population-based vaccine coverage surveys that rely on vaccination cards or parental recall or both may overestimate vaccination coverage.

de Nuncio ML, Price SA, Tjoa T, Lashuay N, Jones MC, Elder JP. **Pretesting Spanish-language educational radio messages to promote timely and complete infant immunization in California**. J Comm Health, 24(4):269-84, Aug 1999.

California's Hispanic infants have lower immunization levels than non-Latino white infants, 53.7% versus 65.2%, respectively. Spanish-language radio is an effective mass media venue for imparting information to Latino populations. It has been demonstrated that lack of parental knowledge of infant immunization timing is associated with delayed immunization coverage. In an effort to improve Latino parent knowledge of immunization timing, two Spanish-language radio commercials were developed to be used in conjunction with community-based educational efforts. In order to gage the potential educational impact of the two commercials, they were pre-tested with a group of low-income Spanish-speaking Latino parents who represented members of the target population for whom the commercials were created. Both commercials were rated favorably by parents, and elicited immunization-specific responses. Although correct recall of the simplified, basic immunization schedule was low, the level of immunization response consistency and overall approval of both commercials appear to support their use as part of Latino infant immunization educational outreach in California.

Findley SE, Irigoyen M, Schulman A. Children on the move and vaccination coverage in a low-income, urban Latino population. Am J Public Health, 89(11):1728-31, Nov 1999.

OBJECTIVES: The purpose of this study was to determine the impact of childhood moves and foreign birth on vaccination coverage among Latino children in New York City. METHODS: Vaccination coverage was assessed in a survey of 314 children younger than 5 years at 2 immunization clinics. RESULTS: Forty-seven percent of the study children had moved abroad. After adjustment for health insurance, regular source of care,

and country of birth, child moves had no independent effect on vaccination coverage. Foreign-born children had diphtheria-pertussis-tetanus, oral polio vaccine, and measles-mumps-rubella vaccination coverage rates similar to those of US-born children, but they were underimmunized in regard to Haemophilus influenzae type b and hepatitis B. CONCLUSIONS: Foreign birth, but not childhood moves, is a barrier to vaccinations among low-income, urban Latino children.

Hellerstedt WL, Olson SM, Oswald JW, Pirie PL. Evaluation of a community-based program to improve infant immunization rates in rural Minnesota. Am J Prev Med, 16(3 Suppl):50-7, April 1999.

OBJECTIVE: The purpose of this study was to evaluate the effects of enrollment in a community-based public health nursing program, Communities Caring for Children (CCC), on infant immunization rates in rural Minnesota. The program involved health education, a registry, and a reminder system. DESIGN: The evaluation was a collaborative effort of university, public health agency, and private managed-care personnel. Two data sources were used to assess the association of program enrollment and immunization compliance; public birth certificates and a telephone survey of 421 CCC enrollees and non-enrollees. RESULTS: Birth certificate and survey data showed that CCC enrollees were significantly younger, less educated, more likely to be white, and of lower parity than non-enrollees. The average age of subjects' infants was eight months. The survey data showed that, overall, CCC enrollees perceived less danger in infant immunizations than did non-enrollees and were more likely than non-enrollees to have access to infant immunization reminder cards. CCC enrollees reported significantly higher immunization compliance for their infants than did non-enrollees. CONCLUSIONS: The area served by this program is relatively low-income and rural. Infant immunization status was among the lowest in Minnesota prior to the implementation of CCC. The evaluation suggested that enrollment in CCC was one of the most powerful predictors of infant immunization compliance.

Mayer ML, Clark SJ, Konrad TR, Freeman VA, Slifkin RT. **The role of state policies and programs in buffering the effects of poverty on children's immunization receipt.** Am J Public Health, 89(2):164-70, Feb 1999.

OBJECTIVES: This study assessed the influence of public policies on the immunization status of 2-year old children in the United States. METHODS: Up-to-dateness for the primary immunization series was assessed in a national sample of 8100 children from the 1988 National Maternal and Infant Health Survey and its 1991 Longitudinal Follow-Up. RESULTS: Documented immunization rates of this sample were 33% for poor children and 44% for others. More widespread Medicated coverage was associated with greater likelihood of up-to-dateness among poor children. Up-to-dateness was more likely for poor children with public rather than private sources of routine pediatric care, but all children living in states where most immunizations were delivered in the public sector were less likely to be up to date. Poor children in state with partial vaccine replacement programs were less likely to be up to date than those in free-market purchase states. CONCLUSIONS: While state policies can enhance immunization delivery for poor children, heavy reliance on public sector immunization does not ensure timely receipt of vaccines. Public- and private-sector collaboration is necessary to protect children from vaccine-preventable diseases.

Teitelbaum MA, Edmunds M. **Immunization and vaccine-preventable illness, United States, 1992 to 1997.** Stat Bull Metrop Insur Co, 80(2):13-20, April-June 1999.

In contrast to the 1980s, immunization rates increased dramatically in the United States in the mid-1990s. Three-quarters of all two-year-olds had received all recommended immunizations in 1997 as compared to just over one-half in 1992. Immunization rates for individual vaccines have reached 90 percent for three of the vaccines--measles, mumps, rubella; pollo; and Haemophilus influenzae type b (Hib). The vaccine for diphtheria, tetanus and pertussis, however, and the newer vaccine for hepatitis B have not yet reached 90

percent of two-year-olds. The rising immunization levels in young children have resulted in declining incidence of almost all of the vaccine-preventable illnesses. Cases of measles and Hib have declined 95 percent and the incidence of rubella and congenital rubella, hepatitis B and mumps has also declined. Pertussis (whooping cough), however, continued its pattern of periodic increases and decreases. This lack of improvement is probably due to a combination of lower immunization levels for pertussis and waning immunity in previously immunized adolescents and young adults. Federal efforts such as the President's Childhood Immunization Initiative along with its Vaccines for Children program have been credited for a great deal of this improvement. These programs increased public awareness of the need for and access to immunizations, better tracking of immunizations and vaccine-preventable illnesses and have also removed cost barriers to receipt of such protection. At the same time, new vaccines (against chickenpox and rotavirus) and safer versions of older vaccines (pertussis) have been brought into widespread use. Children can now be vaccinated against increasing varieties of childhood diseases. While progress in immunization has been good, areas in need of improvement remain. Pertussis continues to be a problem both in terms of incidence and immunization levels. Also, immunization levels differ significantly by poverty level and race and ethnicity. Black, Hisparic, American Indian and Asian children are less likely to be fully immunized than non-Hispanic white children and poor children are less likely to be fully immunized than non-poor children.

Wood D, Saarlas KN, Inkelas M, Matyas BT. Immunization registries in the United States: Implications for the practice of public health in a changing health care system. Annu Rev Public Health, 20:231-55, 1999.

Although immunization rates among children are rising across the country, rates in inner-city areas have remained at approximately 50%-60%, < or = 30% lower than corresponding suburban or state immunization levels. The failure to raise immunization levels in poor, underserved populations is caused in part by the lack of timely and accurate child-specific immunization information for providers and parents, Immunization registries are a new tool in health care that can be used to address these and other barriers to effective immunization delivery. Moreover, immunization registries have the potential to help health care officials track and improve delivery for a broad range of important child health services. An immunization registry is a computerized database of information on children (usually preschool-age children) in a defined population (e.g. those enrolled in a health maintenance organization or living in a specific geographic area), which is used to record and track all immunizations received by each child. The registry receives the information primarily from public and private providers that administer immunizations, as well as from parents, schools, and other agencies. A fully functioning immunization registry can be used to identify individual children in need of immunizations and to report on immunization rates by population characteristics such as child age, assigned provider, or geographic area (e.g. neighborhood, city). Today, > 250 local public health departments have immunization registries that are in various stages of planning or development. Only a small number of these registries meet the minimum functional criteria of maintaining records on 95% of all eligible 2-year-old children in the target population and providing an electronic immunization record that is accessible to providers. Nascent immunization registries represent innovative technologic solutions to the challenge of monitoring health problems and health care access on a population basis. This is a fundamental activity of public health agencies, but one that is increasingly shared by large health maintenance organizations. The study of the development of immunization registries across the United States provides an important case study for how public health agencies will use the rapidly developing health information infrastructure to perform health assessment and health assurance activities in a managed care environment.

1998

Adams WG, Geva J, Coffman J, Palfrey S, Bauchner H. Anemia and elevated lead levels in underimmunized inner-city children. Pediatrics, 101(3 Pt 1):E6, March 1998.

OBJECTIVE: Underimmunized children are less frequently screened for anemia and elevated lead levels than those who are up-to-date (UTD). However, the association between underimmunization and actual disease has not been reported. The objective of this study was to evaluate the association between underimmunization, anemia, and elevated lead levels among children attending an inner-city clinic. STUDY DESIGN: Data from a computer-based immunization tracking system were integrated with primary care-based laboratory data. Cross-sectional data for immunization coverage, anemia, and elevated lead levels were evaluated for children who were 1, 2, 3, and 4 years of age. The first Hgb or PbB values obtained within six months of the child's birthday were used. Setting. An inner-city hospital-affiliated pediatric primary care center. PATIENTS: A child was considered to be a pediatric primary care center patient if he/she had at least three immunizations in the immunization tracking system and at least 1 Hgb or PbB screening test during February 1993 through February 1996. RESULTS: A total of 4045 Hgb tests from 2672 children were available for analysis (1198, 1102, 945, and 800 at 1, 2, 3, and 4 years of age, respectively). Anemia was common during the first 4 years of life (21.2%, 15.8%, 11.0%, and 10.3% at 1, 2, 3, and 4 years of age, respectively). At 2 and 3 years of age, underimmunized children were significantly more likely to be anemic compared with UTD children. Underimmunized children with anemia at one year of age were less likely than UTD children to resolve their anemia by two years of age. Underimmunized children were also significantly more likely to have elevated lead levels at two years of age. CONCLUSION: Underimmunized children in the inner city are at especially high risk for anemia and elevated lead levels. These children need routine preventive health services, as well as immunization. Integrating laboratory screening data with immunization tracking systems would be an important step toward improving the health of inner-city children.

Aggressive programs improve immunization rates for children of low-income women. Health Demand Dis Manag, 4(10):155-6, Oct 1998.

Two unique programs are boosting immunization rates, improving prenatal care, and increasing the rate of well-baby exams for the children of low-income, unmarried women. Here's what's working in this hard-to-reach population.

Alderman EM, Shapiro A, Spigland I, Coupey SM, Bashir M, Fox AS. **Are there risk factors for hepatitis B infection in inner-city adolescents that justify prevaccination screening?** J Adolesc Health, 22(5):389-93, May 1998.

PURPOSE: This study was undertaken to determine if homelessness could serve as a marker for previous hepatitis B infection (HBI), and thus justify prevaccination screening. METHODS: One hundred sexually active 13-21-year-olds (mean=17 years), 74% female, attending an inner-city hospital-based adolescent clinic (HOSP), and 48 sexually active 13-21-year-olds (mean=19 years), 40% female, attending a clinic based at an urban drop-in center (UDC) for street youth were consecutively enrolled, screened for HBI serum markers and administered a structured interview about sexual practices, sexual abuse, prior sexually transmitted diseases (STDs), and injection drug use. RESULTS: For the HOSP group, 7% were homeless and 4% were HBI positive. In the UDC group, 96% were homeless and 23% were HBI positive. Homelessness was

significantly associated with HBI. Other factors significantly associated with HBI in adolescents included a history of anal sex, anal-receptive sex, genital Chlamydia, prostitution, and sexual abuse. For both populations, gender, sexual orientation, intravenous drug use, and genital sex were not related to HBI. CONCLUSION: These data indicate that homelessness and associated high-risk sexual practices may be indications for prevaccination screening for HBI in adolescents.

Alexy B, Elnitsky C. Rural mobile health unit: Outcomes. Publ Health Nurs, 15(1):3-11, 1998.

The Mobile Health Unit was implemented to increase access to nursing services, to improve and/or maintain functional status and health status, and to increase health promotion behaviors of rural elderly residents experiencing difficulty obtaining health care due to illness, transportation problems, or financial factors. For 222 project participants, 1,773 encounters were completed, with a mean number of visits per individual of 7.9. Participants in the project demonstrated increased breast and cervical cancer screening, increased immunization rates for influenza, pneumonia and tetanus, and decreased utilization of the emergency room. This project represents an alternative model of health care delivery in a rural area with limited resources and health care providers.

Bolton P, Holt E, Ross A, Hughart N, Guyer B. **Estimating vaccination coverage using parental recall, vaccination cards, and medical records.** Public Health Reports 113(6): 521-526, Nov-Dec 1998.

OBJECTIVE: To compare estimates based on vaccination cards, parental recall, and medical records of the percentages of children up-to-date on vaccinations for diphtheria, tetanus, and pertussis; polio; and measles, mumps, and rubella. METHOD: The authors analyzed parent interview and medical records data from the Baltimore Immunization Study for 525 2-year-olds born from August 1988 through March 1989 to mothers living in low-income Census tracts of the city of Baltimore. RESULTS: Only one-third of children had vaccination cards; based on medical records, these children had higher up-to-date coverage at 24 months of age than did children without cards. For individual vaccines, only two-thirds of parents could provide information to calculate coverage rates; however, almost all provided enough information to estimate coverage for the primary series. For each vaccine and the series, parental recall estimates were at least 17 percentage points higher than estimates from medical records. For children without vaccination cards whose parents could not provide coverage information, up-to-date rates based on medical records were consistently lower than for children with cards or with parents who provided coverage information. CONCLUSIONS: Population-based vaccine coverage surveys that rely on vaccination cards or parental recall or both may overestimate vaccination coverage.

Kenyon TA, Matuck MA, Stroh G. Persistent low immunization coverage among inner-city preschool children despite access to free vaccine. Pediatrics, 101(4 Pt 1):612-6, April 1998.

OBJECTIVE: To compare vaccination coverage among children 19 - 35 months of age from public housing developments where a free vaccine outreach program was in place with children residing elsewhere in the city. DESIGN: A household survey using a multistage cluster sampling method to compare community areas which accounted for 80% of measles cases during 1989 (high-risk stratum), areas which accounted for the remaining 20% of cases (low-risk stratum), and public housing developments (public housing stratum) having free, on-site vaccination services. SETTING: Inner-city Chicago households, April - May 1994. OUTCOME VARIABLES: Antigen-specific and series-specific coverage based on written records. RESULTS: Based on evaluation of 1,244 children, citywide coverage for four doses of diphtheria-tetanus-pertussis vaccine, three doses of polio vaccine, and one dose of measles-containing vaccine (4:3:1) was 47%. Coverage was significantly lower among children residing in public housing (23%) compared with those residing in

high-risk strata (45%) and low-risk strata (51%). Compared with white children (53%), coverage for the 4:3:1 series was lower among African-American children in public housing (29%) or outside public housing (36%). Moreover, 11% of children residing in public housing had never received any immunizations. CONCLUSIONS: African-American children in Chicago, particularly in public housing, remain at increased risk for vaccine-preventable diseases and should be targeted for vaccination services. Vaccination coverage remains low several years after a major outbreak of measles and implementation of a free vaccine outreach program. Cluster surveys may be useful for monitoring vaccination coverage in high-risk urban settings.

Office of Minority Health, US Dept. of Health and Human Services. **Closing the Gap: Immunization Issue**. Washington, DC, Office of Minority Health - RC, Nov 1998.

This issue of the monthly newsletter, Closing the Gap, focuses on immunization, for children to adults, with an emphasis on reaching and protecting minorities. Topics include community flu projects, the under-use of vaccine by minorities, raising awareness, influenza, diabetes, hepatitis B, and outreach. AVAILABLE FROM: Closing the Gap, Office of Minority Health - RC, PO Box 37337, Washington, DC 20013-7337. Phone: 800-444-6472.

Schuster MA, Wood DL, Duan N, Mazel RM, Sherbourne CD, Halfon N. **Utilization of well-child care services for African-American infants in a low-income community: Results of a randomized, controlled case management/home visitation intervention**. Pediatrics, 101(6):999-1005, June 1998.

OBJECTIVE: To evaluate a case management/home visitation intervention to improve access to and utilization of well-child care (WCC) visits. STUDY DESIGN: Randomized, controlled trial with baseline and follow-up interview surveys. Mothers and infants in the intervention group were assigned to a case manager who made at least four home visits during the infant's first year of life. In addition, the case managers contacted clients by telephone and mail to see if they had kept their WCC appointments and to follow up on other issues. SAMPLE AND DATA COLLECTION: A population-based random sample of African-American mothers of newborns from South Central Los Angeles: 185 mothers in the intervention group and 180 in the control group completed both interview surveys. The principal outcome variable was number of WCC visits. Additional outcome variables included the child's type of insurance, the number of months with insurance coverage during the first year of life, age when first enrolled in Medi-Cal, age at the first WCC visit, usual source of WCC, travel time to the usual source of care, whether the child had a regular provider, and whether the child ever needed care but did not get it. RESULTS: There was little change in the overall distribution of number of WCC visits during the first year of life. Comparisons of the cumulative numbers of visits for each possible cutoff showed that children in the intervention group were more likely than children in the control group to have at least four visits (81% vs 70%). CONCLUSIONS: In light of the high expense of this intervention, our evaluation shows that our moderate-intensity case management and home visitation program is not an effective way to increase the number of WCC visits.

Wood D, Halfon N, Donald-Sherbourne C, Mazel RM, Schuster M, Hamlin JS, Pereyra M, Camp P, Grabowsky M, Duan N. Increasing immunization rates among inner-city, African American children. A randomized trial of case management. JAMA, 79(1):29-34, Jan 7, 1998.

CONTEXT: Immunization rates in the inner city remain lower than in the general US population, but efforts to raise immunization levels in inner-city areas have been largely untested. OBJECTIVE: To assess the effectiveness of case management in raising immunization levels among infants of inner-city, African American families. DESIGN: Randomized controlled trial with follow-up through one year of life. SETTING: Low-income areas of inner-city Los Angeles, Calif. PATIENTS: A representative sample of 419 African American infants and their families. INTERVENTIONS: In-depth assessment by case managers before

infants were 6 weeks of age, with home visits two weeks prior to when immunizations were scheduled and additional follow-up visits as needed. MAIN OUTCOME MEASURES: Percentage of children with up-to-date immunizations at age one year, characteristics associated with improved immunization rates, and cost-effectiveness of case management intervention. RESULTS: A total of 365 newborns were followed up to age one year. Overall, the immunization completion for the case management group was 13.2 percentage points higher than the control group (63.8% vs 50.6%). In a logistic model, the case management effect was limited to the 25% of the sample who reported 3 or fewer well-child visits; for them, immunization levels increased by 28 percentage points. Although for the case management group intervention was not cost-effective (\$12022 per additional child immunized), it was better (\$4546) for the 25% of the sample identified retrospectively to have inadequate utilization of preventive health visits. CONCLUSIONS: A case management intervention in the first year of life was effective but not cost-effective at raising immunization levels in inner-city, African American infants. The intervention was demonstrated to be particularly effective for subpopulations that do not access well-child care; however, currently there are no means to identify these groups prospectively. For case management to be a useful tool to raise immunizations levels among high-risk populations, better methods of tracking and targeting, such as immunization registries, need to be developed.

1997

Anderson LM, Wood DL, Sherbourne CD. **Maternal acculturation and childhood immunization levels among children in Latino families in Los Angeles**. Am J Publ Health, 87(12):2018-21, Dec 1997.

OBJECTIVES: This examines the relationship between acculturation levels of poor Latina women in Los Angeles and their children's immunization status. Receipt of three doses of DPT vaccine and two doses of oral polio vaccine by 12 months was considered adequate immunization. METHODS: Interviews were conducted in East Los Angeles and South Central Los Angeles with mothers (n=688) about one randomly selected child aged 12 to 36 months. RESULTS: One fourth of the children were inadequately immunized. Less-acculturated mothers were more likely to have adequately immunized children. Inadequate prenatal care, absence of close family members, the child's birth position as other than firstborn, and more than one relocation during the child's lifetime were associated with inadequate immunization. CONCLUSIONS: The findings challenge the notion that children of recent immigrants bear a higher risk of underimmunization.

National Association of Community Health Centers. **Immunizations: National programs, policies and recommendations**. Washington, DC, National Association of Community Health Centers, March 1997.

This reference tool highlights some of the major changes in national immunization programs, policies and recommendations, along with resources related to immunizations. Topics include: a guide to contraindications, clinical issues, education and outreach, quality improvement, and state and national linkages. AVAILABLE FROM: National Association of Community Health Centers, Inc., 1330 New Hampshire Ave., NW, Suite 122, Washington, D.C. 20036. Phone: 202/659-8008 x129. Fax: 202/659-8519.

Ramsey AH, Steinmann WC, Capps A, Diaz A, Netland K, Plotkin S, Wuttke J. **St. Thomas Immunization Initiative.** A student-run community action project. J La State Med Soc, 149(6):197-9, June 1997.

The objectives of the St Thomas Immunization Initiative are to provide a clinical community medicine experience for first- and second-year medical students, expose students to a community immunization program, teach students the principles of a community immunization program, and demonstrate a working relationship between the residents of an underserved community and medical students. From 1993 to 1995,

first- and second-year students at Tulane University Medical School participated in class projects known as Shots for Tots and the St Thomas Immunization Initiative. Students received instruction about immunizations and administered vaccinations to children and adults in low-income neighborhoods. From 1993 to 1995, 754 immunizations were administered to 331 children. Participating students were surveyed and 82% of those who responded to a questionnaire felt that the project benefited the community while 79% felt that they personally benefited from participating in the project. Given their experience, 96% of the students would be more likely to participate in a community development project in the future.

Taylor JA, Davis RL, Kemper KJ. A randomized controlled trial of group versus individual well child care for high-risk children: Maternal-child interaction and developmental outcomes. Pediatrics, 99(6):E9, June 1, 1997.

OBJECTIVE: To determine if group well childcare (GWCC) for high-risk children affects maternal-child interaction and development as compared to these outcomes in children receiving traditional individual well child care (IWCC). STUDY DESIGN: Randomized controlled trial. PARTICIPANTS: Infants less than four months old at the initiation of the study who came from high-risk families. Families were classified as high risk, and eligible for study participation, if the mother had one or more of the following characteristics: poverty, single marital status, less than a high school education, age less than 20 years at delivery, previous substance abuse, or a history of abuse as a child. SETTING: Two urban, university pediatric clinics in Seattle, Washington, Interventions, Study children were randomized to receive GWCC or IWCC prior to the first study visit at the age of four months. Study health supervision visits were scheduled at 4, 5, 6, 8, 10, 12, and 15 months of age. For children randomized to receive GWCC, study visits consisted of an age-matched group discussion of child rearing issues, either preceding or following a brief physical examination. After the 15-month visit, development of study patients was assessed by the use of Bayley Scales of Infant Development (Bayley). Maternal-child interaction and the home environment were evaluated by the use of the Nursing Child Assessment Teaching Scale (NCATS) and the Home Observation for Measurement of the Environment (HOME), respectively. RESULTS: At least one outcome measure was obtained on 114 children; 86 patients completed all three outcome measures. Bayley psychomotor mean scores were 103.6 for GWCC patients versus 100.0 for those receiving IWCC; mean scores for the mental section were 99.3 and 100.4, respectively. The prevalence of high-risk maternal-child interactions was 10% in both the GWCC and IWCC groups. A high-risk home environment was found in 16% of IWCC patients versus 4% of those randomized to GWCC. Provider time was similar among groups (mean number of minutes/patient/study visit: 19.8 and 20.4 for GWCC and IWCC, respectively. CONCLUSION: GWCC is a viable alternative to IWCC for high-risk children. Developmental outcomes and maternal-child interaction are at least as good for children who received GWCC as compared to traditional IWCC, without any increase in provider time required. well child care, child development, maternal-child interaction, Bayley Scales of Infant Development, Nursing Child Assessment Teaching Scale, Home Observation for Measurement of the Environment.

1996

Birkhead GS, Cicirello HG, Talarico J. The impact of WIC and AFDC in screening and delivering childhood immunizations. J Public Health Manag Pract, 2(1):26-33, Winter 1996.

Two publicly funded programs, the Special Supplemental Food Program for Women, Infants and Children (WIC) and Aid to Families with Dependent Children (AFDC), serve large numbers of children who may be at risk for poor immunization status. A review of the literature as well as conference abstracts and program reports for studies of immunization initiatives carried out in these settings was conducted. Although the available literature is limited, it does indicate that children in these programs have low immunization levels and that interventions to improve their immunization status can be successful. Measures to improve

Davis TC, Bocchini JA Jr, Fredrickson D, Arnold C, Mayeaux EJ, Murphy PW, Jackson RH, Hanna N, Paterson M. **Parent comprehension of polio vaccine information pamphlets.** Pediatrics, 97(6 Pt 1):804-10, June 1996.

BACKGROUND: Medical information pamphlets often are written using language that requires a reading level higher than parents of many pediatric patients have achieved. Anecdotal reports suggest that many parents may not readily understand the federally mandated Public Health Service vaccine information pamphlets prepared by the Centers for Disease Control and Prevention (CDC) in 1991. The level at which the pamphlets need to be written for low-reading-level parents is undetermined, as is whether parents reading at higher levels will accept low-reading-level materials. METHODS: To determine whether a simple pamphlet prepared at a low reading level using qualitative and adult education techniques would be preferable to the available CDC polio vaccine information pamphlet, we conducted an integrated qualitative-quantitative study. We compared the parent reading time and comprehension of a simplified pamphlet (Louisiana State Univ., LSU) comprising four pages, 322 words, seven instructional graphics, and a text requiring a 6th grade reading ability with the equivalent 1991 CDC vaccine information pamphlet comprising 16 pages, 18,177 words, no graphics, and a text requiring a 10th grade reading level. We measured the reading ability of 522 parents of pediatric patients from seen at public clinics (81%) and in a private office (19%). Of the entire group, 39% were white, 60% African-American, and 1% Hispanic; the mean age was 29 years; the mean highest grade completed was 12th grade 3 months; and the reading level was less than 9th grade in 47% of parents and less than 7th grade in 20%. After parents were given one of the pamphlets to read, their reading time, comprehension, and attitude toward the pamphlet were measured. RESULTS: Mean comprehension was 15% lower for CDC than for LSU (56% vs 72% correct) and reading time was three times longer for CDC than for LSU (13 min. 47 sec. vs 4 min. 20 sec.). These trends were significant for parents reading at all but the lowest levels. Mean comprehension and reading time did not differ among parents reading at the 3rd grade level or less. However, mean comprehension was greater and reading time lower for LSU among parents at all reading abilities greater than the 3rd grade. Parents in the private practice setting took the longest time to read the CDC (20 min. 59 sec. vs 5 min. 46 sec., LSU), yet their comprehension on the LSU was significantly higher than on the CDC (94% vs 71%). Two focus groups of high-income parents were unanimous in preferring the LSU. CONCLUSIONS: A short, simply written pamphlet with instructional graphics was preferred by highand low-income parents seen in private and public clinics. The 6th grade reading level appears to be too high for many parents in public clinics; new materials aimed at 3rd to 4th grade levels may be required. The new 1994 CDC immunization materials, written at the 8th grade level, may still be inappropriately high. The American medical community should adopt available techniques for the development of more effective patient-parent education materials.

Fairbrother G, Friedman S, DuMont KA, Lobach KS. Markers for primary care: Missed opportunities to immunize and screen for lead and tuberculosis by private physicians serving large numbers of inner-city Medicaid-eligible children. Pediatrics, 97(6 Pt 1):785-90, June 1996. Comment in: Pediatrics, 97(6 Pt 1):898-9, June 1996.

OBJECTIVE: This study examines coverage levels for immunization, missed opportunities to immunize, and extent of lead and tuberculosis screening in inner-city storefront physician offices and then relates child, visit, and physician characteristics to missed opportunities. METHODOLOGY: With the use of a nested sampling strategy, 232 charts were selected for review in 31 physicians' offices. Charts selected were for children 0 to 35 months of age who had three or more visits in more than 3 months. Physicians were selected from those in specific low-income New York inner-city neighborhoods who submitted large volumes of Medicaid billing claims. Variables examined were missed opportunities to immunize, immunization coverage levels, lead, and tuberculosis screening. The outcome measure was missed opportunities to immunize. RESULTS: Only 26%

of the children were up to date for their age for diphtheria, tetanus, pertussis (DTP), oral polio vaccine (OPV), and measles, mumps, rubella (MMR) compared with a city-wide coverage level of 49%. Children who were not up to date for immunization coverage were more likely not to be up to date for lead or tuberculosis screening. Physicians miss opportunities to immunize in 84% of the eligible visits. Opportunities to immunize are missed more frequently at sick care or follow-up visits (95% and 91% missed opportunities) than at well care visits (41% missed opportunities). CONCLUSIONS: The quality of pediatric primary care given by these inner-city storefront physicians is suboptimal. Sick and follow-up visits predominate; well care visits are infrequent. If care is to be improved, Medicaid reimbursement policies, which make delivery of well care unprofitable, will need to be changed. In addition, monitoring the quality of care will need to be more aggressive. In the near future children who receive Medicaid in New York will be in managed care. If reimbursement and monitoring policies that provide incentives for delivering pediatric primary care are to be in place, it will be the managed care plans that implement this.

Hamlin JS, Wood D, Pereyra M, Grabowsky M. **Inappropriately timed immunizations: Types, causes, and their relationship to record keeping**. Am J Public Health, 86(12):1812-4, Dec 1996.

OBJECTIVES: This study examined inappropriately timed immunizations and their relationship to record keeping practices in Los Angeles public health centers. METHODS: Records of children's visits were reviewed at four public health centers maintaining separate records. RESULTS: One third of all children seen at both immunization-only and well child clinics were given inappropriately timed immunizations. Almost half of the immunizations were not transferred between sets of records. Children seen in both clinics were more than twice as likely to receive at least one inappropriately timed immunization as those seen only at the well child clinic. CONCLUSIONS: Keeping separate immunization records at separate clinics leads to inappropriately timed immunizations.

Kumar S, Scheffler S, Singleton S, Lawrence M. Influenza immunization rates for Louisiana Medicare beneficiaries (1993-1995): A need for interventions. J La State Med Soc, 148(10):423-9, Oct 1996.

Influenza is a disease, especially in the elderly, with potentially serious health and fiscal consequences. Vaccines, even though available and proven to be efficacious for prevention, appear to be underutilized in the Medicare population. This paper highlights influenza immunization rates from 1993-1995 for Louisiana Medicare eligible beneficiaries served by Louisiana providers. The authors discuss some of the current efforts underway to increase the number of influenza vaccinations. This was a retrospective study of claims based data on Medicare beneficiaries in Louisiana. Rates were also compared to other states from published Health Care Financing Administration data over the study period. In Louisiana, from 1993-1995, approximately 31% of Medicare beneficiaries age 65 years or older received an influenza vaccination that was paid for by Health Care Financing Administration. This finding indicates an attainment of half of the Department of Health and Human Services Year 2000 goal of 60% influenza immunization rate. The rate for Medicare African-American beneficiaries was approximately one half that of Caucasian beneficiaries. Overall, the billing data indicated that female beneficiaries received influenza immunization slightly more often than male. Medicare beneficiaries aged 75 to 84 years were immunized proportionally more than other age groups. The age group with the smallest percentage of immunized beneficiaries was 85 years or older. These results and rates obtained from the National Health Information Survey and Behavioral Risk Factor Surveillance System for the state collectively indicate marked opportunity for improvement in immunization rates for the State of Louisiana. Health care providers can assist and play an integral role in interventions designed to impact on this vulnerable population in order to meet the Department of Health and Human Services Year 1996 overall goal of 56% influenza immunization rate for all persons age 65 years or older.

LeBaron CW, Birkhead GS, Parsons P, Grabau JC, Barr-Gale L, Fuhrman J, Brooks S, Maes E, Friedman S, Hadler SC. **Measles vaccination levels of children enrolled in WIC during the 1991 measles epidemic in New York City**. Am J Public Health, 86:1551-6, Nov 1996.

OBJECTIVES: This study assessed measles vaccination rates and risk factors for lack of vaccination among preschool children enrolled in the Special Supplemental Food Program for Women, Infants, and Children (WIC) during the 1991 measles epidemic in New York City. METHODS: Children aged 12 to 59 months presenting for WIC certification between April 1 and Sept. 30, 1991, at six volunteer WIC sites in New York City were surveyed. RESULTS: Of the 6181 children enrolled in the study, measles immunization status was ascertained for 6,074 (98%). Overall measles coverage was 86% and at least 90% by 21 months of age. Young age of the child, use of a private provider, and Medicaid as a source of health care payment were risk factors for lack of vaccination. CONCLUSIONS: During the peak of a measles epidemic, measles immunization rates were more than 80% by 24 months of age in a sample of WIC children. The ease of ascertaining immunization status and the size of the total WIC population underscore the importance of WIC immunization initiatives.

Moore P, Fenlon N, Hepworth JT. **Indicators of differences in immunization rates of Mexican American and white non-Hispanic infants in a Medicaid managed care system**. Public Health Nurs, 13(1):21-30, Feb 1996.

Immunization levels of Mexican American and white non-Hispanic infants enrolled in Arizona's Medicaid managed care demonstration project, a prototype of the model proposed for a reformed health care system, were compared and the influence of sociodemographic characteristics, acculturation levels, health beliefs of the mothers, and infant health status on immunization levels were assessed. The study used data collected from office records, birth certificates, and household interviews. The random sample included 292 white non-Hispanic and 274 Mexican American infants. White non-Hispanic infants received more immunizations by age one than the Mexican American infants. However, after controlling for a full set of explanatory variables in a multiple regression analysis, ethnicity was no longer a significant predictor of immunization levels. Significant predictors of a higher number of immunizations included fewer siblings, older maternal age, and higher maternal education. Health insurance and enrollment in a managed care plan were not sufficient to ensure adequate immunization of these Medicaid enrolled infants. Results are discussed in terms of previous research and the essential functions of public health as outlined in the Institute of Medicine's Report on the Future of Public Health.

Moran WP, Nelson K, Wofford JL, Velez R, Case LD. **Increasing influenza immunization among high-risk patients: Education or financial incentive?** Am J Med, 101(6):612-20, Dec 1996.

PURPOSE: To determine whether an educational brochure or a lottery-type incentive increases influenza immunization rates. PATIENTS AND METHODS: In a prospective, single-blind factorial design randomized trial at an urban community health center, all high-risk patients (n=797) seen in the preceding 18 months were randomly assigned to one of four groups: a control group; a group mailed a large print, illustrated educational brochure emphasizing factors important to patients in making a decision about influenza immunization; a group mailed a lottery-type incentive announcing that all patients receiving influenza immunization would be eligible for grocery gift certificates; and a group mailed both educational brochure and incentive. Immunization was free, available without an appointment, and recorded by a computerized tracking system. RESULTS: The group mailed the brochure was more likely to be immunized than control, as was the group mailed the incentive, but there was no difference between the group mailed both interventions and the control group. The effectiveness of the brochure was more striking for individuals who had not accepted immunization in the prior year, suggesting a true educational effect rather than simply a reminder. CONCLUSION: In this community health center setting, an illustrated educational brochure increased influenza immunization among high-risk patients, a lottery-type incentive was much less effective, and both together was not effective.

Strobino D, Keane V, Holt E, Hughart N, Guyer B. **Parental attitudes do not explain underimmunization**. Pediatrics, 98(6 Pt 1): 1076-83, Dec 1996.

OBJECTIVE: This article describes the results of a community-based study to determine the effect of family knowledge and attitudes on the immunization rates of a random sample of children younger than two years in the poorest census tracts of Baltimore. DESIGN AND METHODS: The two sources of data were: 1) parent interviews that provided data on knowledge, attitudes, and beliefs related to immunization and sociodemographic characteristics and 2) medical record audits from which data on immunization status were obtained. The protection motivation theory, a model of behavioral change, was used to select the variables to assess the relation of parental attitudes with immunization status. A multivariate logistic regression analysis included only variables found to be significantly associated with immunization outcome in the preliminary analysis. RESULTS: Mothers were well informed and generally had favorable attitudes toward immunizations. Immunization status was more strongly associated with the sociodemographic characteristics of the children than with the protection motivation theory variables. Only two protection motivation theory variables were associated with more than one immunization outcome. The children of mothers who perceived that timing of vaccination did not matter were less likely to be immunized than children of care takers who thought that it did matter and children whose parents believed in the safety of multiple immunizations were less likely to be immunized than children whose parents did not hold this belief. CONCLUSIONS: In this study, parents' attitudes and beliefs had little effect on their children's immunization levels. Interventions intended to heighten parental awareness about immunization may have little impact. In poor urban neighborhoods, African-American children whose mothers are young, have multiple siblings, and do not use the Women, Infants and Children program may be at highest risk for delayed immunization.

Waterman SH, Hill LL, Robyn B, Yeager KK, Maes EF, Stevenson JM, Anderson KN. **A model immunization demonstration for preschoolers in an inner-city barrio, San Diego, California, 1992-1994.** Am J Prev Med, 12(4 Suppl):8-13, July 1996.

An immunization demonstration project was conducted in an inner-city Latino neighborhood in San Diego to address underimmunization of children of preschool age. The project attempted interventions on consumer, provider, and system levels to reduce barriers to immunization and raise immunization rates. Free walk-in immunization clinics with emphasis on cultural sensitivity and that incorporated computerized reminder/recall were established. An educational series was offered to community health center (CHC) providers, and extensive community-based outreach and education took place in schools, churches, a WIC site, etc. Evaluation activities included preintervention and postintervention provider knowledge, attitudes, and practice surveys, CHC chart audits, and household surveys in the intervention ZIP code area and a control ZIP code area. Immunization coverage for 4DPT, 3OPV, and 1MMR (4:3:1) among two-year-olds increased significantly from 37% to 50% overall, and to 59% in the 1991 birth cohort in the intervention area compared to a one percentage point overall increase in the control area. Coverage improved significantly and missed opportunities decreased in one intervention CHC that participated most actively in educational inservices. While the Year 2000 U.S. Public Health Service objective of 90% 4:3:1 coverage for two-year-olds was not achieved over the 21-month course of the project, the results approached the 1996 single-antigen objectives. This demonstration underscores the importance of multilevel interventions including low cost, no appointment, and culturally appropriate immunization services for the indigent; the use of computerized reminder systems; and provider assessment, education, and feedback in the effort to raise preschool immunization levels. Medical Subject Headings (MeSH): immunization, preschool-age children, health promotion, provider education, immunization monitoring and follow-up systems, pediatric immunization standards, household surveys.

Watson MA, Feldman KW, Sugar NF, Sommer CJ, Thomas ER, Lin T. **Inadequate history as a barrier to immunization**. Arch Pediatr Adolesc Med, 150(2):135-9, Feb 1996.

OBJECTIVES: To evaluate how lack of immunization history contributes to missed opportunities for immunization and to document the effort required to obtain immunization history. DESIGN: Cross-sectional. SETTING: Urban, inner-city primary care pediatric clinic serving a low-income, multiethnic population. PATIENTS: Ninety-five new patients seen for either well-child care (53 patients) or acute illnesses (42 patients) during a four-month period in 1993. Fifty-nine patients were aged 3 to 59 months and 36 were aged 5 to 15 years. MEASUREMENTS: Efforts to obtain immunization history were documented by means of a standardized data collection form. RESULTS: Immunization history was obtained for only 26 (27%) of 95 patients during the initial visit. Caregivers of 74 (78%) of 95 patients did not bring immunization records to the initial visit; they were no more likely to bring records for well-child care than for acute care or for younger vs older children. Parents brought immunization records more often than did non-parents. A total of 145 telephone calls were made and 30 letters were sent in an attempt to obtain immunization histories. Immunization records were never found for 10 new patients (11%). Thirty-two patients (34%) were found to be lacking immunizations. Of these, only three patients had contraindications to immunization at the initial visit. Therefore, in one third of our new patients, opportunities to immunize were missed solely because their immunization records were unavailable at the initial visit. In another one third of cases, caregivers had incorrectly believed their child's immunizations to be up to date. CONCLUSIONS: Opportunities to immunize children were often missed because of a lack of immunization history. Our experience supports the need for improved documentation of immunization histories.

Wood D, Halfon N, Pereyra M, Hamlin JS, Grabowsky M. **Knowledge of the childhood immunization schedule and of contraindications to vaccinate by private and public providers in Los Angeles**. Pediatr Infect Dis J, 15(2): 140-5, Feb 1996.

BACKGROUND: Missed opportunities to vaccinate occur commonly, contributing to underimmunization of young children. They are related to provider knowledge of the immunization schedule and contraindications to vaccination. METHODS: We surveyed private physicians (n=50) and public health physicians and nurses (n=47). The questionnaire presented two sets of clinical scenarios in which they had to assess what immunizations were due and assess whether there were any contraindications to vaccination. RESULTS: The mean percent correct responses on the immunization schedule questions was 64% for the private physicians, 71% for the public physicians and 78% for the public nurses. The mean percent correct responses on the contraindications to vaccinate questions was 73% for public physicians, 58% for private physicians, and 55% for public health nurses. CONCLUSIONS: Providers in the public and private sectors have important deficits in knowledge of the immunization schedule and the appropriate contraindications to vaccinate which might lead to missed opportunities to vaccinate and low immunization coverage.

1995

Abramson JS, O'Shea TM, Ratledge DL, Lawless MR, Givner LB. **Development of a vaccine tracking system to improve the rate of age-appropriate primary immunization in children of lower socio-economic status**. J Pediatr, 126(4):583-6, April 1995. Retracted in J Pediatr, 127(2):338, Aug 1995.

A randomized, controlled trial was conducted to determine the effectiveness of an immunization tracking system designed to increase the number of infants of lower socioeconomic status who receive their primary series of vaccinations at age-appropriate times. By seven months of age, 91% of the infants in the intervention group were up-to-date on their primary series of vaccinations versus 72% of the infants in the control group. The estimated cost of follow-up for each infant in the intervention group was \$18.05.

Barnes-Boyd C. Effects of sustained nurse/mother contact on infant outcomes among low-income African-American families. Public Health Nurs, 12(6):378-85, Dec 1995.

This study examined the effect on infant morbidity and mortality of sustained nursing contact with mothers of healthy infants who are considered medically low risk but socially are at high risk due to poverty, low maternal education, and parenting at an early age. A quasi-experimental approach using a pretest-posttest design was used to evaluate the effect of the sustained nursing contact intervention (n=97) compared with the instructions traditionally provided to the mothers of such infants (n=48). In general, intervention and control infants did not differ on variables measuring health and development, morbidity, incidence of accidents, utilization of health care services, or immunization rates. Intervention infants scored significantly higher on advanced gross motor skills and had significantly fewer upper respiratory symptoms at the final visit. Highest morbidity was experienced by infants of teenaged mothers in the control group who had more than one infant. It was concluded that sustained nursing contact during the first eight months of infant life was beneficial to low-income African-American mothers, especially teenaged mothers with more than one infant. Infant morbidity and mortality were lower in both groups than would have been expected for their risk level, indicating that even minimal sustained nursing contact enhances outcomes of healthy infants at high risk for mortality and morbidity due to social factor.

Birkhead GS, LEBaron CW, Parsons P, Grabau JC, Maes E, Barr-Gael L, Fuhrman J, Brooks S, Rosenthal JHadler SC, et al. **The immunization of children enrolled in the Special Supplemental Food Program for Women, Infants, and Children (WIC). The impact of different strategies.** JAMA, 274(4):312-316, July 26, 1995. Published erratum appears in JAMA, 274(22):1762, Dec 13, 1995.

OBJECTIVE: To assess the impact of different interventions to increase measles vaccination coverage among preschool children enrolled in the Special Supplemental Food Program for Women, Infants, and Children (WIC). DESIGN: Public health intervention trial. SETTING: Six volunteer WIC sites in New York City. STUDY PARTICIPANTS: Children aged 12 to 59 months presenting for WIC certification between April 1 and September 30, 1991, who were eligible for measles vaccination. INTERVENTIONS: Two WIC sites were randomly assigned to one of three immunization strategies: (1) escort: child was escorted to a nearby pediatric clinic for immunization; (2) voucher incentive: the family returned monthly, rather than every two months, to pick up WIC food vouchers until the child was immunized; or (3) referral: the family was referred for immunization. MAIN OUTCOME MEASURE: Proportion of eligible children receiving measles vaccination. RESULTS: Of children eligible for measles immunization, 74% were immunized. Children at escort sites were 5.5 times and those at voucher incentive sites were 2.9 times more likely to be immunized than children at referral sites. Children were immunized more rapidly at escort sites (median, 14 days) and voucher incentive sites (median, 26 days) than at referral sites (median, 45 days). CONCLUSIONS: Both escort and voucher incentive models resulted in more children being immunized more rapidly than passive referral. Because of ease of administration, voucher incentives may be a more suitable immunization intervention for use at WIC sites, with addition of escort where feasible.

Wood D, Donald-Sherbourne C, Halfon N, Tucker MB, Ortiz V, Hamlin JS, Duan N, Mazel RM, Grabowsky M, Brunell P, et al. **Factors related to immunization status among inner-city Latino and African-American preschoolers**. Pediatrics, 96(2 Pt 1):295-301, Aug 1995.

OBJECTIVE: To identify factors associated with undervaccination at 3 and 24 months among low-income, inner-city Latino and African-American preschool children. DESIGN: Interviews with a representative sample of inner-city families. SETTING: South Central and East Los Angeles areas in inner-city Los Angeles. POPULATION: Eight hundred seventeen Latino and 387 African-American families with children between 12 and 36 months of age. MAIN OUTCOME VARIABLES: Being fully immunized or up-to-date (UTD) at three months (1 diphtheria-tetanus-pertussis vaccine and 1 oral polio vaccine) and 24 months of age (4 diphtheria-tetanus-pertussis vaccines, 3 oral polio vaccines, and 1 measles-mumps- rubella vaccine). METHODS: Logistic regressions of UTD immunization status at three and 24 months by population and

health care system factors. RESULTS: Seventy percent of Latino children and 53% of African-American children were UTD at three months of age. At 24 months of age, 42% of Latino children and 26% of African-American children were UTD on their immunizations. Receipt of the first immunizations by three months was associated with smaller family size, and evidence of connection to prenatal care. Latino children were less likely to be UTD at 24 months if they obtained well child care from private providers versus public clinics. There was also a trend for Latino children to be less well immunized if they were in health maintenance organizations versus public clinics. African-American children were more likely to be UTD at 24 months if they were UTD at three months, had more health visits, and were less likely to be UTD at 24 months if they were on Medicaid versus private insurance. IMPLICATIONS: Both African-American and Latino children in inner-city Los Angeles have low immunization rates at 3 and 24 months. Prenatal care and family size are strongly associated with being UTD by 3 months; however, family and child characteristics are relatively unimportant predictors of being UTD at 24 months of age. Important risk factors for underimmunization at two years of age in inner-city, low-income communities include type of health insurance and source of well child care, with the public sector having higher rates than private doctors' offices or health maintenance organization/managed care plans.

1994

Bates AS, Fitzgerald JF, Dittus RS, Wolinsky FD. **Risk factors for underimmunization in poor urban infants**. JAMA, 272(14):1105-10, October 12, 1994.

OBJECTIVE: To assess risk factors for underimmunization in poor urban infants. DESIGN: Prospective cohort study. SETTING: A large municipal teaching hospital in the Midwest. PARTICIPANTS: A total of 464 healthy, full-term newborn infants delivered at a large municipal teaching hospital that were to be discharged to the care of their mothers. Mothers were interviewed 24 to 72 hours postpartum regarding personal and financial characteristics and 9 to 12 months later to determine where immunizations had been received. MAIN OUTCOME MEASURES: Immunization status at 3 and 7 months of age. RESULTS: Despite availability of free vaccine to most patients, only 67% had received their first set of immunizations by three months of age, and only 29% were up-to-date by seven months of age. Marital status, co-residence with the infant's grandmother, adequacy of prenatal care, and perceived barriers to care were significant independent predictors of initiation of immunizations by three months and completion of immunization by seven months. Poverty was also an independent predictor of immunization status at seven months. Perceived susceptibility to common symptoms and perceived benefit of medical care to prevent disease were inversely related to immunization status at seven months. CONCLUSIONS: These data suggest that poor urban infants of single mothers and of mothers who received inadequate prenatal care, and those not living with their grandmother should be targeted for tracking and follow-up to ensure adequate immunization. The provision of free vaccine alone will not guarantee adequate immunization coverage of poor urban children.

Erkel EA, Morgan EP, Staples MA, Assey VH, Michel Y. Case management and preventive services among infants from low-income families. Public Health Nurs, 11(5):352-60, Oct 1994.

To determine the impact of an experimental approach to case management on use of child health clinic and immunization services, a nonequivalent control group with covariate measures design was employed in a sample of 98 infants from low-income families. The innovative pattern of care featured continuity of care; a single public health nurse (PHN) provided child health care to an infant by integrating case management and preventive services. In contrast, the customary pattern of child health care was characterized by fragmentation of services. Case management was segregated from preventive services, and multiple PHNs delivered care to an infant. As predicted, experimental-group infants (44%) were more likely to achieve adequate child health clinic services than control-group infants (8%). Moreover, the cost-effectiveness (C/E) ratio (dollar cost per

effective intervention) for adequate child health clinic visits in continuous care (\$523) was one-fifth of that in fragmented care (\$2,900). The C/E ratio related to adequate immunization was 8% less in continuous care (\$359) than in the fragmented approach (\$386), although the difference in rates of adequate immunization was non-significant (experimental group, 64%; control group, 60%). These findings suggest that continuous PHN care with integrated case management is a more effective, cost-efficient approach to critical child preventive services than the customary, segregated case-management approach.

Melman ST, Kaplan JM, Caloustian ML, Weinberger JA, Smith J, Anbar RD. **Readability of the childhood immunization information forms**. Arch Pediatr Adolesc Med, 148(6):642-4, June 1994.

OBJECTIVE: To compare the reading level required to understand childhood immunization information forms with the reading grade level of an inner-city parent/caretaker population. DESIGN: Descriptive study (parents/caretakers). SETTING: Inner-city pediatric clinic. PARTICIPANTS: One hundred fifty English-speaking, low-income parent/caretakers. MEASUREMENTS/MAIN RESULTS: The reading level of our parent population ranged from grades 2.9 to 13.3, with a median grade level of 6.90. The reading levels required for the three vaccine information pamphlets issued in 1992 by the Centers for Disease Control and Prevention (Atlanta, Ga) averaged 11.1 (approximately at the level of a high school junior). Eighty-six percent of our parents/caretakers did not have a reading level sufficient to cope with the easiest of the forms. CONCLUSIONS: The vaccine information pamphlets require a reading level beyond the capability of the vast majority of our parent population. Therefore, the goal of informed consent clearly is not being met.

Redlener I, Karich KM. The homeless child health care inventory: Assessing the efficacy of linkages to primary care. Bull N Y Acad Med, 71:37-48, Summer 1994.

Each year, the New York City homeless family shelter system provides transitional housing for nearly 20,000 homeless children. While the health care needs of these children are substantial, there is currently no system-wide mechanism for ensuring that they have access to appropriate medical care. This report analyzes information from the Homeless Child Health Care Inventory, a survey conducted by Montefiore Medical Center's Division of Community Pediatrics, to examine the adequacy of health care resources available to the homeless children in New York City. Results showed that available health care resources varied considerably throughout the shelter system and that nearly 50% of homeless children in New York City did not have access to appropriate medical care.

Redlener I, Redlener KB System-based mobile primary pediatric care for homeless children: The anatomy of a working program. Bull N Y Acad Med, 71:49-57, Summer 1994.

Wiecha JM, Gann P. **Does maternal prenatal care use predict infant immunization delay?** Fam Med, 26(3):172-8, March 1994.

BACKGROUND: The proportion of infants in the United States adequately immunized with DTP (Diphtheria, Tetanus and Pertussis) vaccine is below other industrialized nations and lowest among infants living in urban areas. At present, predictors of poor immunization are not well developed. In particular, the relationship between prenatal care utilization and childhood vaccination is not clearly defined. METHODS: Using medical record data, we measured associations between prenatal variables and adequacy of immunization (three DTP vaccines by age 10 months) in 163 mother-infant pairs who received prenatal and child care at a neighborhood community health center. RESULTS: At the end of 10 months' follow-up, 29.4% of infants had not received three DTP immunizations. Logistic regression identified the following

independent risk factors for immunization delay: multiparity, being an English-speaking Hispanic mother, and failing to attend scheduled prenatal care appointments. In the regression model, interactions also existed between having a high proportion of missed visits to total prenatal visits scheduled (> or = 25%) and receiving social services, with the highest risk existing for women with a high proportion of missed appointments who also received social services, and the lowest for those with < 25% missed appointments who received social services. CONCLUSIONS: Maternal demographics and health care utilization predict infant immunization rates. Use of these variables may permit early identification and case management of mothers of infants at high risk for immunization delay.

Wood D, Halfon N, Sherbourne C, Grabowsky M. Access to infant immunizations for poor, inner-city families: What is the impact of managed care? J Health Care Poor Unders, 5(2):112-23, 1994.

California plans to enroll half of its Medicaid population, 75% of which are children, into managed care. To measure the impact of managed care on utilization of preventive services, we surveyed 867 families in two inner-city areas of Los Angeles and assessed the relationship between insurance type, source of care, and access to immunization services. Compared to children in public health clinics, those in private physicians' offices or health maintenance organizations (HMOs) had odds of being up-to-date on immunizations of 0.43 and 0.24, respectively. We conclude that in the absence of meaningful financial incentives to encourage private physicians and HMOs to provide immunizations to inner-city children, managed care is unlikely to improve immunization rates among this vulnerable population.

1993

Abbotts B, Osborn LM. Immunization status and reasons for immunization delay among children using public health immunization clinics. Am J Dis Child, 147(9):965-8, Sept 1993.

OBJECTIVES: To determine whether children attending our local health department clinics were being immunized in a timely manner, and to investigate the reasons for children not being immunized on schedule. DESIGN: Cross-sectional research design. SETTING: Five Salt Lake City/County Health Department immunization clinics in Utah. PARTICIPANTS: All patients presenting to the clinics for immunization from November 1990 to March 1991 when minor illness is prevalent. INTERVENTIONS: Data were gathered through interview and questionnaire. MEASUREMENTS/MAIN RESULTS: Children were mostly white; they came from two-parent households with reasonably high incomes and high parental education level. Only four children were denied vaccination, all for inappropriate timing. None were denied for illness. More than 75% had postponed bringing their children in for immunization. The most common reason given for delay was minor illness in the child. CONCLUSION: Even in this "low-risk" population, parental misperception regarding immunizations is a significant, contributing factor to low immunization rates. Public educational programs directed at increasing parental knowledge must be developed.

Fierman AH, Dreyer BP, Acker PJ, Legano L. Status of immunization and iron nutrition in New York City homeless children [see comments] Clin Pediatr (Phila), 32:151-5, March 1993.

A retrospective review of the hospital records of New York City children aged six months through six years showed that 63 homeless children had a higher rate of immunization delay than an age- and sex-stratified sample of 63 domiciled children living at the same federal poverty level. In a logistic regression model, this difference persisted after controlling for sex, age, ethnicity, presence of chronic illness, and reason for referral. In a six-month- to two-year old subgroup, homeless and domiciled children had equal rates of anemia, but homeless children were more likely to have elevated erythrocyte protoporphyrin (EP) levels consistent with iron deficiency. This difference, too, persisted after controlling for the same confounding factors. Elevated EP levels and immunization delay were likely to coexist in the homeless children. The higher rate of immunization delay is compatible with the occurrence of measles outbreaks in some New York City shelters. The higher rates of iron deficiency may reflect overall poor nutrition. All these findings have significant implications for the design of health care programs for homeless children.

Hinman AR. **Disease prevention programs for racial and ethnic minorities**. Ann Epidemiol, 3:185-92, March 1993.

Many studies show a dramatic relationship between socioeconomic status and disease incidence. Clear racial and ethnic disparities also exist in the occurrence of diseases such as acquired immunodeficiency syndrome (AIDS), tuberculosis and syphilis. Consequently, to identify true risk factors for diseases when planning prevention programs, the effect of socioeconomic status must be differentiated from that of race or ethnicity. Further, different cultural heritages and social structures may affect how interventions are perceived or used and this must also be taken into account when planning programs. The Centers for Disease Control, through its National Center for Prevention Services, provides financial and technical assistance to state and local health departments to develop approaches that are culturally sensitive and linguistically appropriate to reach persons in racial and ethnic minority groups.

Page AJ, Ainsworth AD, Pett MA. Homeless families and their childrens health problems. A Utah urban experience. West J of Med, 158(1):30-5, Jan 1993.

Descriptive information was obtained about homeless families in the Intermountain West and their children-s health care needs were defined to help professionals develop programs tailored to meet the unique needs of this population. We collected data during the well-child visits of 306 children in 161 families living at the Travelers Aid Society family shelter. The results reveal two types of homeless families, episodic and long term. Each requires different levels of assistance. This study-s profile of mobile, predominantly white, two-parent families with few children (mean of 1.2) differs considerably from that of studies conducted on the East and West coasts. The families=nomadic life-style (73.1% came from 32 states other than Utah) present important public health issues, especially because of the recent resurgence of tuberculosis and declining levels of childhood immunizations. The children-s health problems were similar to those reported nationally: delayed immunizations, dental decay, anemia, and impaired vision.

Primas PJ, Baca G, Petticrew DA, Moffett C, White JK, Primas HR, and Norman S. A multi-dimensional assessment of the health needs of homeless infants and pre-school children in Phoenix. J of Soc Distr and the Homel, 2(1):61-72, 1993.

The dual purpose of this study was to identify the comprehensive health needs of a selected group of homeless children in Phoenix, Az., and to utilize the findings in developing needed services. A non-random sample of 60 infants and pre-school children was given on-site physical, dental, developmental, behavioral, and nutritional assessments. Fifty-eight of the 60 children screened needed further evaluation, treatment, or follow-up services. The most significant problems included low hematocrit readings, inadequate immunizations, and untreated medical and dental problems specific to this age group. Also identified were developmental delays and potential behavior problems (authors).

Redlener I. **Overcoming barriers to health access for medically underserved children**. J Ambul Care Managem, 16(1):21-8, 1993.

As many as 5,200 families, including about 12,000 children, are homeless on any given night in New York City. Over the course of a year, 20,000 to 25,000 children are officially identified as homeless. A study of 650 children in early 1992 found only one-third had up-to-date immunizations; 28% had asthma; 47% had had otitis media within 18 months; 19% had anemia; 32% had visited a hospital emergency department; 6% had been hospital inpatients within three months; only 9% had private physicians; and 62% were receiving hospital-based services as a normal mode of care. In response to the medical needs of homeless children, the New York Children-s Health Project (NYCHP) was initiated in 1987. NYCHP operates three mobile medical units that visit 15 sites in New York City. Range of services include comprehensive care, primary care follow-up, case management and gatekeeping functions, and medical records management.